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IS : 3715 (Part IV) - 1971
(Reaffirmed 2002)

Indian Standard

LETTER SYMBOLS FOR SEMICONDUCTOR DEVICES

PART IV THYRISTORS

(First Revision)

UDC 003·62 : 621·382·233

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April 1972

Indian Standard

LETTER SYMBOLS FOR SEMICONDUCTOR DEVICES

PART IV THYRISTORS

(First Revision)

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(*Continued on page* 2)

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(*Continued from page* 1)

Panel for Terminology of Semiconductor Devices, ETDC 40:P5

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Indian Standard

LETTER SYMBOLS FOR SEMICONDUCTOR DEVICES

PART IV THYRISTORS

(First Revision)

0. FOREWORD

0.1 This Indian Standard (Part IV) (First Revision) was adopted by the Indian Standards Institution on 27 October 1971, after the draft finalized by the Semiconductor Devices and Integrated Circuits Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard covers typical letter symbols for use in the field of thyristors. They have been compiled in accordance with the rules laid in IS : 3715 (Part I)-1971*.

0.2.1 For definitions of terms for which letter symbols are specified in this standard, reference may be made to IS : 1885 (Part VII/Sec 4)-1969†.

0.3 This standard should be used in conjunction with IS : 3715 (Part I)-1971* and any symbol for any other quantity or parameter should be derived in accordance with the rules laid therein.

0.4 The main purpose of specifying letter symbols is to enable the technical characteristics of manufacturers' products to be described to their users, and it is in this field that the standards on letter symbols are expected to prove most useful. A system of letter symbols is also necessary for mathematical calculations concerning the operation of semiconductor devices and for allied technical descriptions; if used for this purpose certain abbreviations or adaptation of the symbols proposed may be necessary or convenient. It is recommended that when such abbreviations are adopted, the formal unabbreviated symbols should first be stated as a means of defining the abbreviated symbols.

0.5 Assistance has been derived from the following in the preparation of this standard :

IEC Pub 148-1969 Letter symbols for semiconductor devices and integrated microcircuits. International Electrotechnical Commission.

BS 3363 : 1968 Schedule of letter symbols for semiconductor devices (Mainly for use in catalogues and similar technical literature). British Standards Institution.

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*Letter symbols for semiconductor devices: Part I General aspects (*first revision*).

†Electrotechnical vocabulary: Part VII Semiconductor devices, Section 4 Thyristors.

0.6 This standard is one of a series of Indian Standards on semiconductor devices. A list of standards so far published in this series is given on page 8.

1. SCOPE

1.1 This standard (Part IV) covers letter symbols to be used for thyristors.

2. PRINCIPAL (ANODE-TO-CATHODE) VOLTAGES

Quantity/Parameter	*Letter Symbol*	*Remarks*
Breakover continuous (direct) voltage	$V_{(BO)}$	—
Reverse breakdown voltage	$V_{(BR)}$	—
Continuous (direct) off-state voltage	V_D	*See* Fig. 1
Peak off-state voltage	V_{DM}	—
Repetitive peak off-state voltage	V_{DRM}	*See* Fig. 1
Non-repetitive peak off-state voltage	V_{DSM}	*See* Fig. 1
Crest (peak) working off-state voltage	V_{DWM}	*See* Fig. 1
Continuous direct reverse voltage	V_R	*See* Fig. 1
Repetitive peak reverse voltage	V_{RRM}	*See* Fig. 1
Non-repetitive peak reverse voltage	V_{RSM}	*See* Fig. 1
Crest (peak) working reverse voltage	V_{RWM}	*See* Fig. 1
On-state voltage	V_T	—
Minimum on-state voltage	V_{TMIN}	—
Instantaneous total value of the on-state voltage	v_T	—
Threshold voltage	$V_{T(TO)}$	—

3. PRINCIPAL (ANODE OR CATHODE) CURRENTS

Quantity/Parameter		
Continuous (direct) breakover current	$I_{(BO)}$	—
Continuous (direct) off-state current	I_D	—
Continuous (direct) holding current	I_H	—

Quantity/Parameter	*Letter Symbol*	*Remarks*
Continuous (direct) reverse blocking current	I_{B}	*See* Fig. 2
Repetitive peak reverse current	I_{RRM}	—
Continuous (direct) on-state current	I_{T}	*See* Fig. 2
Average value of on-state current	$I_{T(AV)}$	—
Overload on-state current	$I_{T(OV)}$	—
Repetitive peak on-state current	I_{TRM}	*See* Fig. 2
Surge (non-repetitive) peak on-state current	I_{TSM}	*See* Fig. 2

4. GATE VOLTAGES

Quantity/Parameter		
Forward gate continuous (direct) voltage	V_{FG}	—
Peak forward gate voltage	V_{FGM}	—
Gate non-trigger continuous (direct) voltage	V_{GD}	—
Gate turn-off continuous (direct) voltage	V_{GQ}	—
Gate trigger continuous (direct) voltage	V_{GT}	—
Minimum gate trigger voltage	$V_{GT,\ MIN}$	—
Reverse gate continuous (direct) voltage	V_{RG}	—
Peak reverse gate voltage	V_{RGM}	—

5. GATE CURRENTS

Quantity/Parameter		
Forward gate continuous (direct) current	I_{FG}	—
Peak forward gate current	I_{FGM}	—
Gate non-trigger continuous (direct) current	I_{GD}	—
Gate turn-off continuous (direct) current	I_{GQ}	—
Gate trigger continuous (direct) current	I_{GT}	—
Reverse gate continuous (direct) current	I_{RG}	—

6. TIME QUANTITIES

Quantity/Parameter	*Letter Symbol*	*Remarks*
Gate controlled turn-off time	t_{gq}	—
Gate controlled turn-on time	t_{gt}	—
Circuit commutated turn-off time (circuit commutated recovery time)	t_q	—

7. OTHER SYMBOLS

Quantity/Parameter		
Average dc gate power	P_G	—
Peak gate power	P_{GM}	—
Total (maximum) power dissipation within the device	P_{tot}	—
On-state slope resistance	r_T	—

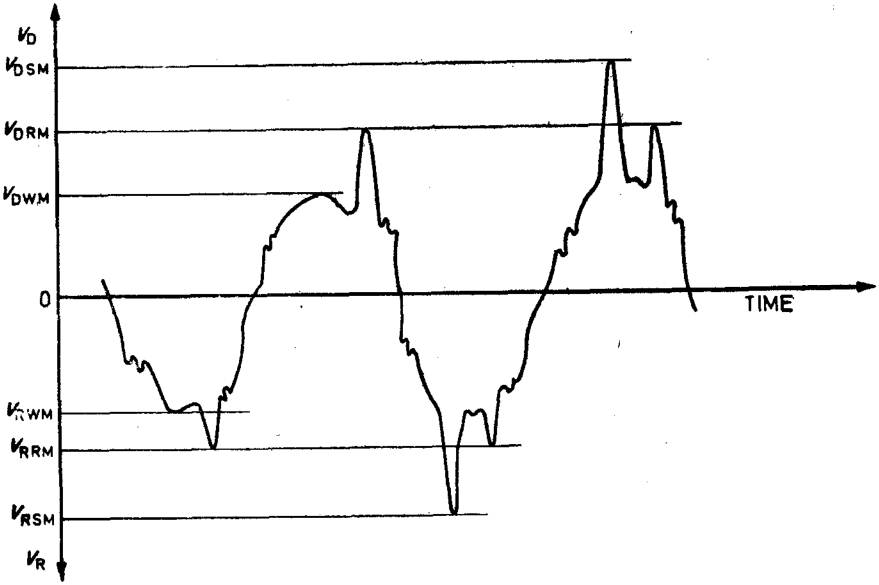

FIG. 1 VOLTAGE WAVEFORM

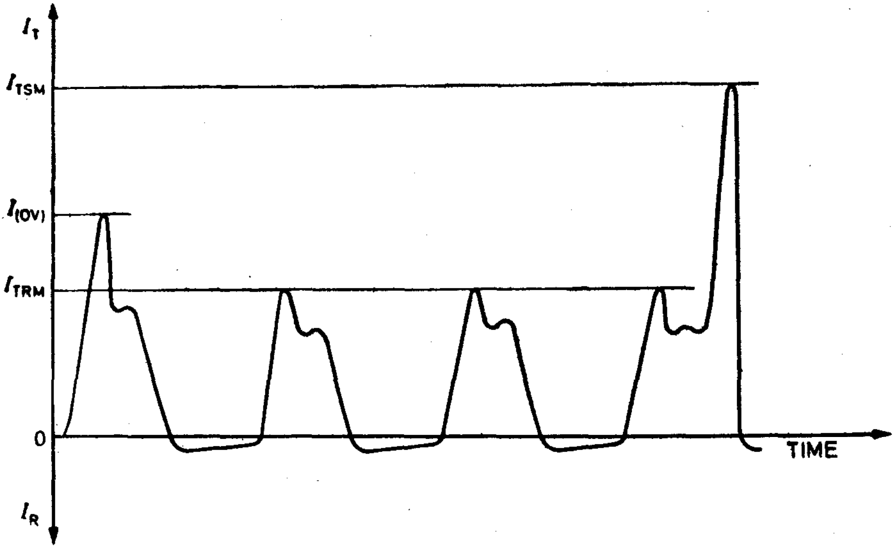

Fig. 2 Current Waveform

INDIAN STANDARDS

ON

Semiconductor Devices

IS:	
1885 (Part VII/Sec 1)-1970	Electrotechnical vocabulary: Part VII Semiconductor devices, Section 1 General
1885 (Part VII/Sec 2)-1970	Electrotechnical vocabulary: Part VII Semiconductor devices, Section 2 Diodes
1885 (Part VII/Sec 3)-1970	Electrotechnical vocabulary: Part VII Semiconductor devices, Section 3 Transistors
1885 (Part VII/Sec 4)-1969	Electrotechnical vocabulary: Part VII Semiconductor devices, Section 4 Thyristors
1885 (Part VII/Sec 5)-1971	Electrotechnical vocabulary: Part VII Semiconductor devices, Section 5 Integrated circuits and microelectronics
2032 (Part VIII)-1965	Graphical symbols used in electrotechnology: Part VIII Semiconductor devices
3700 (Part I)-1966	Essential ratings and characteristics of semiconductor devices: Part I General
3700 (Part II)-1967	Essential ratings and characteristics of semiconductor devices: Part II Low power signal diodes
3700 (Part III)-1967	Essential ratings and characteristics of semiconductor devices: Part III Rectifier diodes
3700 (Part IV)-1968	Essential ratings and characteristics of semiconductor devices: Part IV Low power small signal transistors
3700 (Part V)-1968	Essential ratings and characteristics of semiconductor devices: Part V Power transistors
3700 (Part VI)-1968	Essential ratings and characteristics of semiconductor devices: Part VI Switching transistors
3700 (Part VII)-1970	Essential ratings and characteristics of semiconductor devices: Part VII Reverse blocking triode thyristors
3700 (Part VIII)-1970	Essential ratings and characteristics of semiconductor devices: Part VIII Voltage regulator and voltage reference diodes
3715 (Part I)-1971	Letter symbols for semiconductor devices: Part I General aspects
3715 (Part II)-1971	Letter symbols for semiconductor devices: Part II Diodes
3715 (Part III)-1971	Letter symbols for semiconductor devices: Part III Transistors
4400 (Part I)-1967	Methods of measurements on semiconductor devices: Part I General
4400 (Part II)-1967	Methods of measurements on semiconductor devices: Part II Low power signal diodes
4400 (Part III)-1968	Methods of measurements on semiconductor devices: Part III Rectifier diodes
4400 (Part IV)-	Methods of measurements on semiconductor devices: Part IV Reverse blocking triode thyristors
4400 (Part VIII)-1970	Methods of measurements on semiconductor devices: Part VIII Voltage regulator and voltage reference diodes
4411-1967	Code of designation of semiconductor devices
5000-	Dimensions of semiconductor devices

NOTE — Standards on dimensions of semiconductor devices are published in loose leaf form (individually priced at Rs 3·00 per standard) and are supplied in an attractive binder (priced at Rs 8·00). So far 21 standards have been published.

5001-1969	Guide for preparations of drawings of semiconductor devices
5469-1969	Code of practice for the use of semiconductor junction devices

PUBLICATIONS OF INDIAN STANDARDS INSTITUTION

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